

Handy Tables for Pipefitters

ALLOWANCE FOR CENTERS OF FITTINGS

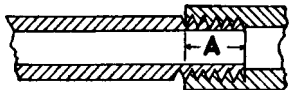
	1/8"	1/4"	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"
90° Ell.	3/16"	7/16"	9/16"	1 1/8"	1 3/8"	1 7/8"	1 1/2"	1 3/4"
Tee	3/16"	7/16"	9/16"	1 1/8"	1 3/8"	1 7/8"	1 1/2"	1 3/4"
Str. Ell.	3/16"	7/16"	9/16"	1 1/8"	1 3/8"	1 7/8"	1 1/2"	1 3/4"
Th'd End	3/8"	1 1/16"	1 1/8"	1 1/4"	1 1/2"	2"	2 1/4"	2 1/2"
Str. Ell.	3/8"	1 1/16"	1 1/8"	1 1/4"	1 1/2"	2"	2 1/4"	2 1/2"
Union	3/8"	1 1/8"	1 1/4"	1 3/8"	1 1/2"	1 3/4"	1 7/8"	1 7/8"
Cplg.	3/8"	1 1/8"	1 1/4"	1 3/8"	1 1/2"	1 3/4"	1 7/8"	1 7/8"
45° Ell.	3/4"	1 1/8"	1 1/4"	1 3/8"	1 1/2"	1 3/4"	1 7/8"	1 7/8"
	2"	2 1/2"	3"	3 1/2"	4"	4 1/2"	5"	6"
90° Ell.	1 1/2"	1 3/4"	2 1/4"	2 3/4"	2 1 1/8"	—	3 3/8"	3 3/8"
Tee	1 1/2"	1 3/4"	2 1/4"	2 3/4"	2 1 1/8"	—	3 3/8"	3 3/8"
Str. Ell.	1 1/2"	1 3/4"	2 1/4"	2 3/4"	2 1 1/8"	—	3 3/8"	3 3/8"
Th'd End	1 1/2"	1 3/4"	2 1/4"	2 3/4"	2 1 1/8"	—	3 3/8"	3 3/8"
Str. Ell.	3"	3 1/4"	4 1/4"	4 3/4"	—	—	—	—
Union	1 1/2"	1 3/4"	2 1/4"	2 3/4"	2 1 1/8"	—	—	—
Cplg.	3/4"	1"	1 1/4"	1 1/2"	1 3/4"	—	—	—
45° Ell.	1"	1 1/4"	1 3/4"	1 3/4"	1 7/8"	—	1 7/8"	2 1/8"

TABLE of WATER HEADS AND EQUIVALENT PRESSURES

To Estimate any Pressure Multiply the Head (in feet) By .4333
The Result is Pounds Per Square Inch.

Head-In Feet	Pressure—Lbs. Per Sq. In.	Head-In Feet	Pressure—Lbs. Per Sq. In.	Head-In Feet	Pressure—Lbs. Per Sq. In.	Head-In Feet	Pressure—Lbs. Per Sq. In.
5	2.17	60	26.00	zso	108.33	500	216.67
10	4.33	JO	30.33	275	119.17	550	238.33
15	6.50	80	34.67	300	130.00	600	260.00
20	8.67	90	39.00	325	140.83	650	281.67
25	10.83	100	43.33	350	151.67	700	303.33
30	13.00	125	54.17	375	162.49	750	325.00
35	15.17	150	65.00	400	173.33	800	346.67
40	17.33	175	75.83	425	184.16	850	368.33
45	19.50	200	86.67	450	195.00	900	390.00
50	21.67	225	97.50	475	205.83	950	411.67
						1000	433.33

ALLOWANCE FOR LENGTH OF THREAD FOR VARIOUS PIPE SIZES



LENGTH OF THREAD ON PIPE

Size Inches	Dim. "A" Inches	Size Inches	Dim. "A" Inches	ME I Inches	Dim. "A" Inches	ME I Inches	Dim. "A" Inches
1/4	1/4	1	3/8	3	1	6	1 1/4
3/8	3/8	1 1/4	3/8	3 1/2	1 1/8	7	1 1/4
1/2	1/2	2	1 1/8	4 1/2	1 3/8	8	1 3/8
3/4	3/4	2 1/2	1 1/4	5	1 1/2	9	1 3/8
1	1	3	1 1/2	5 1/2	1 5/8	10	1 1/2
1 1/4	1 1/4	3 1/2	1 3/8	6	1 3/4	11	1 1/2
1 1/2	1 1/2	4	1 1/2	6 1/2	1 7/8	12	1 1/2

SOCKET SIZES

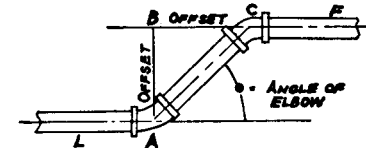
Socket	S.A.E.	U.S.S.	Cap Scr.	Socket	S.A.E.	U.S.S.	Cap Scr.
3/8	—	1/8	1/8	1 1/8	3/4	3/8	—
1/2	—	1/4	1/4	1 1/4	7/8	3/4	1
3/4	1/4	3/8	3/8	1 3/8	—	—	1 1/8
1	3/8	1/2	1/2	1 1/2	—	—	1 1/4
1 1/4	1/2	3/4	3/4	1 3/4	1 1/8	1	—
1 1/2	5/8	7/8	7/8	1 7/8	1 1/4	1 1/8	—
1 3/4	3/4	1	1	2	1 3/8	1 1/4	—
2	7/8	1 1/8	1 1/8	2 1/8	1 1/2	1 3/8	—
2 1/4	1	1 1/4	1 1/4	2 1/4	—	—	1 1/2
2 1/2	1 1/8	1 1/2	1 1/2	2 1/2	—	—	1 1/2
2 3/4	1 1/4	1 3/4	1 3/4	2 3/4	—	—	1 3/4
3	1 1/2	1 3/4	1 3/4	3	—	—	1 3/4
3 1/4	1 3/4	1 3/4	1 3/4	3 1/4	—	—	2
3 1/2	1 3/4	1 3/4	1 3/4	3 1/2	—	—	—
3 3/4	1 3/4	1 3/4	1 3/4	3 3/4	—	—	—
4	1 3/4	1 3/4	1 3/4	4	—	—	—
4 1/4	1 3/4	1 3/4	1 3/4	4 1/4	—	—	—
4 1/2	1 3/4	1 3/4	1 3/4	4 1/2	—	—	—
4 3/4	1 3/4	1 3/4	1 3/4	4 3/4	—	—	—
5	1 3/4	1 3/4	1 3/4	5	—	—	—
5 1/4	1 3/4	1 3/4	1 3/4	5 1/4	—	—	—
5 1/2	1 3/4	1 3/4	1 3/4	5 1/2	—	—	—
5 3/4	1 3/4	1 3/4	1 3/4	5 3/4	—	—	—
6	1 3/4	1 3/4	1 3/4	6	—	—	—

DRILL SIZES FOR PIPE APS

Size of Tap	Briggs Standard		Size of Tap	British Whitworth	
	Thread	Drill		Thread	Drill
1/8	27	2 1/4	1/8	28	3/16
1/4	18	2 3/4	1/4	19	3/16
3/8	18	3 1/8	3/8	19	3/16
1/2	14	1 1/4	1/2	14	23/32
			3/4	14	23/32
			1	14	23/32
1	11 1/2	1 1/8	1	11	1 1/8
1 1/4	11 1/2	1 1/8	1 1/4	11	1 1/2
1 1/2	11 1/2	1 23/32	1 1/2	11	1 23/32
			1 3/4	11	1 31/32
2	11 1/2	2 1/8	2	11	2 1/8
			2 1/4	11	2 13/32
2 1/2	8	2 1/8	2 1/2	11	2 23/32
			2 3/4	11	3 1/32
3	8	3 3/8	3	11	3 3/32
			3 1/4	11	3 1/2
3 1/2	8	3 11/8	3 1/2	11	3 3/4
			3 3/4	11	4
4	8	4 3/8	4	11	4 1/4
4 1/2	8	4 11/8	4 1/2	11	4 3/4
5	8	5 1/4	5	11	5 1/4
			5 1/2	11	5 3/4
6	8	6 3/8	6	11	6 1/4

TABLE OF CONSTANTS FOR FINDING DISTANCE BETWEEN ELBOW CENTERS

There are Elbow Angles other than 45°; such as 60°, 30°, 22 1/2°, 11 1/4°, and 5 1/2°. For such, the Distance between Elbow Centers can easily be found by use of the following Table of Constants:



ELBOW CONSTANTS

Angle of Elbow	Elbow Center AC	Offset AB
60°	1.15	.58
45°	1.41	1.00
30°	2.00	1.73
22 1/2°	2.61	2.41
11 1/4°	5.12	5.02
5 1/2°	10.20	10.15

FORMULA

AC = Offset AB x Constant for AC

BC = Offset AB x Constant for AB

Allow deductions of Elbows for length of projections.

Compiled by and reprinted courtesy of Mr. Bill Noe, Pipefitter Foreman, Laclede Steel Company, Alton, Ill.

Reprints available on request from Armstrong Machine Works.

Three Rivers, Mich. 49093, U.S.A.

DIMENSIONS OF GASKETS

STANDARD AND LOW PRESSURE FLANGES				MEDIUM AND EXTRA HEAVY FLANGES					
SIZE OF PIPE	RING GASKETS		FULL FACED GASKETS		SIZE OF PIPE	RING GASKETS		FULL FACED GASKETS	
	I.D.	O.D.	I.D.	O.D.		I.D.	O.D.	I.D.	O.D.
3/4"	3/4"	2 1/8"	3/4"	3 1/2"	1"	1"	2 7/8"	1"	4 7/8"
1"	1"	2 3/8"	1"	4 1/2"	1 1/4"	1 1/4"	3 1/4"	1 1/4"	5 1/4"
1 1/4"	1 1/4"	3"	1 1/4"	4 5/8"	1 1/2"	1 1/2"	3 3/4"	1 1/2"	6 1/4"
1 1/2"	1 1/2"	3 3/8"	1 1/2"	5"	2"	2"	4 3/8"	2"	6 1/2"
2"	2"	4 1/8"	2"	6"	2 1/2"	2 1/2"	5 1/8"	2 1/2"	7 1/2"
2 1/2"	2 1/2"	4 7/8"	2 1/2"	7"	3"	3"	5 7/8"	3"	8 1/4"
3"	3"	5 3/8"	3"	7 1/2"	3 1/2"	3 1/2"	6 1/2"	3 1/2"	9"
3 1/2"	3 1/2"	6 3/8"	3 1/2"	8 1/2"	4"	4"	7 1/8"	4"	10"
4"	4"	6 7/8"	4"	9"	4 1/2"	4 1/2"	7 3/4"	4 1/2"	10 1/2"
4 1/2"	4 1/2"	7"	4 1/2"	9 1/4"	5"	5"	8 1/2"	5"	11"
5"	5"	7 3/4"	5"	10"	6"	6"	9 1/8"	6"	12 1/2"
6"	6"	8 3/8"	6"	11"	7"	7"	11"	7"	14"
7"	7"	10"	7"	12 1/2"	8"	8"	12 1/8"	8"	15"
8"	8"	11"	8"	13 1/2"	9"	9"	13"	9"	16 1/4"
9"	9"	12 1/2"	9"	15"	10"	10"	14 1/4"	10"	17 1/2"
10"	10"	13 3/8"	10"	16"	12"	12"	16 3/8"	12"	20 1/2"
12"	12"	16 1/8"	12"	19"	14"	14"	19 1/8"	14"	23"
14"	14"	17 3/4"	14"	21"					

HAND TAPS FOR BOLTS

Tap	Thread Series	Dia. Hole	Drill	Tap	Thread Series	Dia. Hole	Drill
1/8	40	.101	38	3/8	18NF	.516	33/64
3/32	36	.129	30	1/2	12NC	.484	31/64
1/4	24	.147	26	5/8	18NF	.578	33/64
5/16	24	.177	16	3/4	11NC	.531	17/32
3/8	28NF	.213	3	1 1/4	16NF	.625	5/8
1/2	20NC	.201	7	1 1/2	11NC	.594	1 1/32
5/8	24NF	.272	1	2	16NF	.688	1 1/16
3/4	18NC	.257	F	2 1/2	10NC	.656	2 1/32
1	24NF	.332	Q	3	14NF	.813	1 1/4
1 1/4	16NC	.313	5/8	3 1/2	9NC	.766	49/64
1 1/2	20NF	.391	23/64	4	14NF	.938	1 1/2
2	14NC	.368	U	5	8NC	.875	7/8
2 1/2	20NF	.453	29/64				
3	13NC	.422	23/64				

Conversion Factors

Power

Multiply	By	To Get	Multiply	By	To Get
Boiler HP	33,472	Btu/hr tbs. H ₂ O evap. at 212°F	Btu/hr	0.0002986	Boiler HP
Boiler HP	34.5	Btu/hr	tbs. H ₂ O evap. at 212°F	0.0290	Boiler HP
Horsepower	2,540	Btu/hr	Btu/hr	0.000393	Horsepower
Horsepower	550	Ft-lbs/sec	Ft-lbs/sec	0.00182	Horsepower
Horsepower-w-w	33,000	Ft-lbs/min	Ft-lbs/min	0.000303	Horsepower
Horsepower	42.42	Btu/min	Btu/min	0.0236	Horsepower
Horsepower	0.7457	Kilowatts	Kilowatts	1.341	Horsepower
Kilowatts	3,415	Btu/hr	Btu/hr	0.000293	Kilowatts
Kilowatts	56.92	Btu/min	Btu/min	0.01757	Kilowatts
Watts	44.26	Ft-lbs/min	Ft-lbs/min	0.02259	Watts
Watts	0.7378	Ft-lbs/sec	Ft-lbs/sec	1.355	Watts
Watts	0.05692	Btu/min	Btu/min	1.757	Watts
Tons Refrig.	12,000	Btu/hr	Btu/hr	0.0000833	Tons Refrig.
Tons Refrig.	200	Btu/min	Btu/min	.005	Tons Refrig.

Energy

Multiply	By	To Get	Multiply	By	To Get
Btu	778	Ft-lbs	Ft-lbs	0.001287	Btu
Btu	0.000393	HP-hrs	HP-hrs	2540	Btu
Btu	0.000293	KW-hrs	KW-hrs	3415	Btu
Btu	0.0010307	Lbs. H ₂ O evap. at 212°F	Lbs. H ₂ O evap. at 212°F	970.4	Btu
Btu	0.00000347	Tons Refrig.	Tons Refrig.	288,000	Btu
Btu	0.293	Watt-hrs	Watt-hrs	3.415	Btu
Ft-lbs	0.3765	Watt-hrs	Watt-hrs	2.656	Ft-lbs
Latent heat of ice	143.33	Btu/lb H ₂ O	Btu/lb H ₂ O	0.006977	Latent heat of ice
tbs. H ₂ O evap. at 212°F	0.284	KW-hrr	KW-hrs	3.52	Lbs. H ₂ O evap. at 212°F
Lbs. H ₂ O evap. at 212°F	0.381	HP-hrs	HP-hrs	2.63	Lbs. H ₂ O evap. at 212°F

Pressure

Multiply	By	To Get	Multiply	By	To Get
Atm.	29.92	1". Merc. (at 62°F)	1". Merc. (at 62°F)	0.03342	Atm.
Atm.	406.0	In. H ₂ O (at 62°F)	1". H ₂ O (at 62°F)	0.002458	Atm.
Atm.	33.90	Ft. H ₂ O (at 62°F)	Ft. H ₂ O (at 62°F)	0.0295	Atm.
Atm.	14.70	Lbs/in ²	Lbs/in ²	0.0680	Atm.
Atm.	1.058	Ton/ft ²	Ton/ft ²	0.945	Atm.
1". H ₂ O (at 62°F)	0.0737	In. Merc. (at 62°F)	1". Merc. (at 62°F)	13.57	1". H ₂ O (at 62°F)
Ft. H ₂ O (at 62°F)	0.881	In. Merc. (at 62°F)	In. Merc. (at 62°F)	1.131	Ft. H ₂ O (at 62°F)
Ft. H ₂ O (at 62°F)	0.4335	Lbs/in ²	Lbs/in ²	2.309	Ft. H ₂ O (at 62°F)
1". Merc. (at 62°F)	70.73	Lbs/ft ²	Lbs/ft ²	0.01603	1". Merc. (at 62°F)
In. Merc. (at 62°F)	0.4912	Lbs/in ²	Lbs/in ²	0.014138	In. Merc. (at 62°F)
			Lbs/in ²	2.042	1". Merc. (at 62°F)

Velocity of Flow

Multiply	By	To Get	Multiply	By	To Get
Ft. per min.	0.01139	Mi. per hr	Mi. per hr	88	Ft. per min
Ft. per min.	0.01667	Ft. per sec	Ft. per sec	60	Ft. per min
Cu. ft. per min.	0.1247	Gal. per sec	Gal. per sec	8.02	Cu. ft per min
cu. ft. per sec.	440.8	Gal. per min	Gal. per min	0.002228	Cu. ft per sec

Heat Transmission

Multiply	By	To Get	Multiply	By	To Get
Btu per in. per sq. ft. per hr per °F	0.0833	Btu per ft. per sq. ft. per hr per °F	Btu per ft. per sq. ft. per hr per °F	12	Btu per in. per sq. ft. per hr per °F

Weight

Multiply	By	To Get	Multiply	By	To Get
tbs.	7000	Groins	Groins	.000143	Lbs.
Lbs. H ₂ O (60°F)	0.01602	Cu. ft. H ₂ O	Cu. ft. H ₂ O	62.37	tbs. H ₂ O (60°F)
Lbs. H ₂ O (60°F)	0.1198	Gal. H ₂ O	Gal. H ₂ O	8.3453	Lbr. H ₂ O (60°F)
Tons (long)	2,240	Lbs.	Lbs.	.000446	Tons (long)
Tons (short)	2,000	Lbs.	Lbs.	.000500	Tons (short)

Circular Measure

Multiply	By	To Get	Multiply	By	To Get
Degrees	0.01745	Radians	Radians	57.3	Degrees
Minutes	0.00029	Radians	Radians	3438	Minutes
Diameter	3.142	Circumference	Circumference	0.3183	Diameter

Volume

Multiply	By	To Get	Multiply	By	To Get
Barrels (Oil)	42	Gal. (Oil)	Gal. (Oil)	3.0238	Barrels (Oil)
cu. ft.	1.728	Cu. in.	Cu. in.	.000579	cu. ft.
cu. ft.	7.48	Gal.	Gal.	0.1337	cu. ft.
Cu. in.	0.00433	Gal.	Gal.	231	cu. in.

Temperature

Multiply	By	To Get	Multiply	By	To Get
Deg. C	1.8	Deg. F	Deg. F	0.555	Deg. C

Fractions and Decimals

Multiply	By	To Get	Multiply	By	To Get
Sixty-fourths	0.015625	Decimal	Decimal	64	Sixty-fourths
Thirty-seconds	0.03125	"	"	32	Thirty-seconds
Sixteenths	0.0625	"	"	16	Sixteenths
Eighths	0.125	"	"	8	Eighths
Fourths	0.250	"	"	4	Fourths
Halves	0.500	"	"	2	Halves

CHART 1100

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